EOS Science Networks Performance Report

This is a summary of EOS QA SCF performance testing for the 4th quarter of 2011 -- comparing the performance against the requirements, including Terra, TRMM, QuikScat, Aqua, Aura, ICESat, and GEOS requirements

Current results can be found on the EOS network performance web site (ENSIGHT): http://ensight.eos.nasa.gov/active_net_measure.html. Or click on any of the site links below.

Highlights:

- Mostly stable performance.
  - **All nodes rated at least Good (mostly Excellent!)**
  - **GPA 3.90** (was 3.77 last quarter)
- Requirements: the Nov '07 requirements are used as the basis for the ratings
  - Requirements update continues

Ratings:

Rating Categories:

Excellent: median of daily worst cases > 3 x requirement
Good: median of daily worst cases > requirement

Adequate: median of daily worst cases < requirement
and
median of daily medians > requirement

Low: median of daily medians < requirement.
Bad: median of daily medians < 1/3 of the requirement.

Ratings Changes:

Upgrades: ↑

LaRC → GHRC: Adequate → Good

GSFC ICEsat → U Texas: Good → Excellent

Downgrades: ↓ None

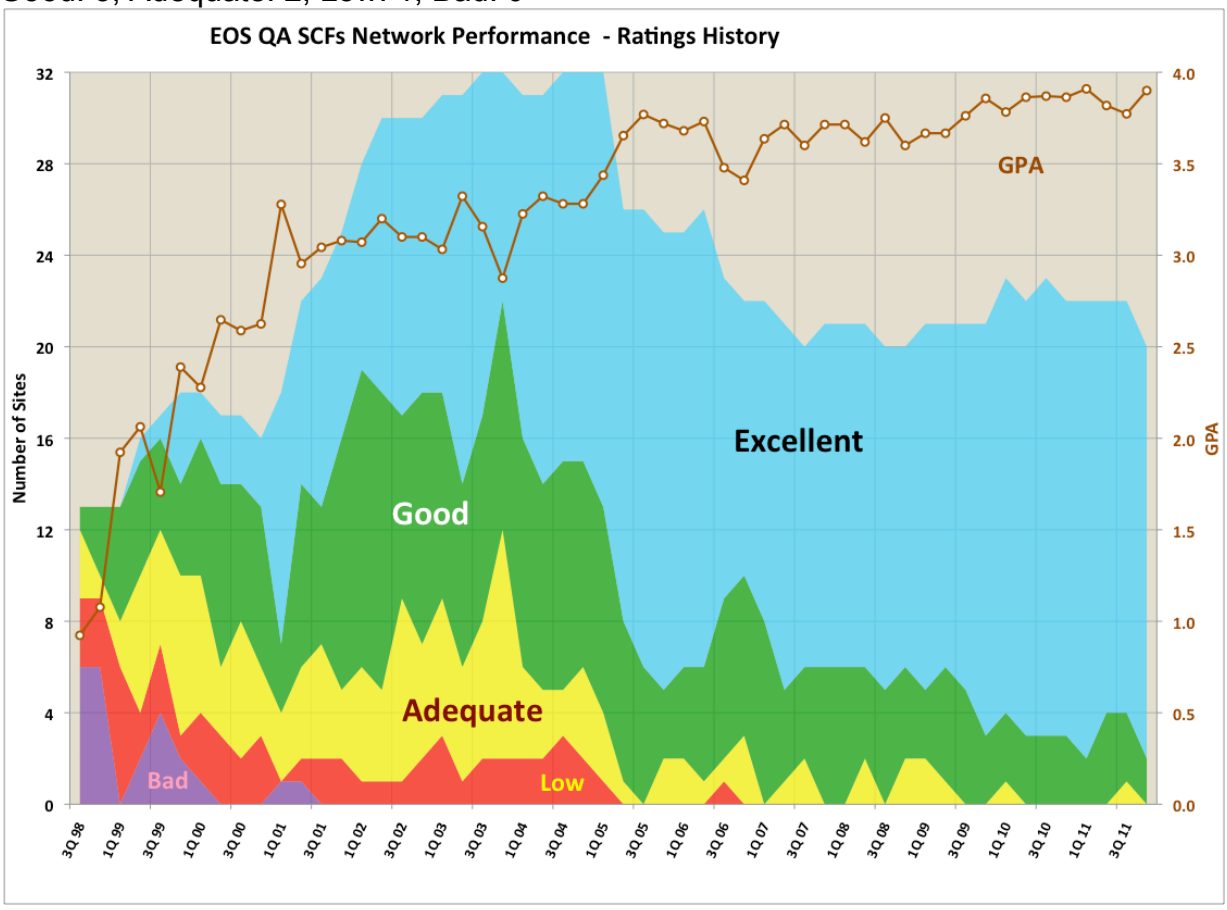
Testing Discontinued: ↓ **JRC (Ispra, Italy)**

Reporting moved: U Wisconsin: Now included in the Production sites report

General Comment: Most testing from GSFC-ENPL was switched to a new (virtual) node in mid September (some in October) – performance was affected.

Ratings History:

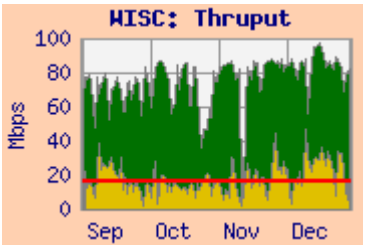
The chart below shows the number of sites in each classification since the testing started in 1998. Note that these ratings do NOT relate to absolute performance -- they are relative to the EOS requirements. The GPA is calculated based on Excellent: 4, Good: 3, Adequate: 2, Low: 1, Bad: 0



Notes: The number of sites included in this chart has changed since 1Q'05 due to:

- 2Q05: Moving the reporting for 6 SIPS sites to the "EOS Production Sites" Network Performance Report.
- 2Q06: Testing discontinued to SAGE III Nodes
- 3Q06: Testing discontinued to NOAA and UMD
- 4Q06: Testing discontinued to UIUC
- 2Q07: Testing discontinued to U Washington
- 1Q09: Testing added to BADC (RAL).
- 1Q10: Testing to Oxford restored.
- 1Q10: ICESAT functions of Ohio State were transferred to Buffalo. Testing to Buffalo added.
- 2Q10: Testing to Ohio State discontinued.
- 3Q10: UIUC added [back]; Testing to MIT discontinued
- 2Q11: Testing discontinued to LANL, PNNL; requirements added to CCRS and Univ of Auckland
- 4Q11: Testing to JRC Discontinued, Wisconsin moved to production sites report.

Integrated Charts: Integrated charts are now included for selected sites with the site details. These charts are "Area" charts, with a pink background. A sample Integrated chart is shown here. The yellow area at the bottom represents the daily average of the user flow from the source facility (e.g., GSFC, in this example) to the destination facility (e.g., Wisconsin, in this example) obtained from routers via "netflow". The green area is stacked on top of the user flow, and represents the "adjusted" daily average iperf thruput between the source-destination pair most closely corresponding to the requirement. This iperf measurement essentially shows the circuit capacity remaining with the user flows active. The adjustments are made to compensate for various systematic effects, and are best considered as an approximation. The red line is the requirement for the flow from the source to destination facilities.



Note: User flow data is has not been available from LaRC since March 2007, so sites with primary requirements from LaRC will not include integrated graphs. (But JPL ← → LaRC flow data is available from JPL, and GSFC ← → LaRC is available from GSFC).

EOS QA SCF Sites Summary: Network Requirements vs. Measured Performance

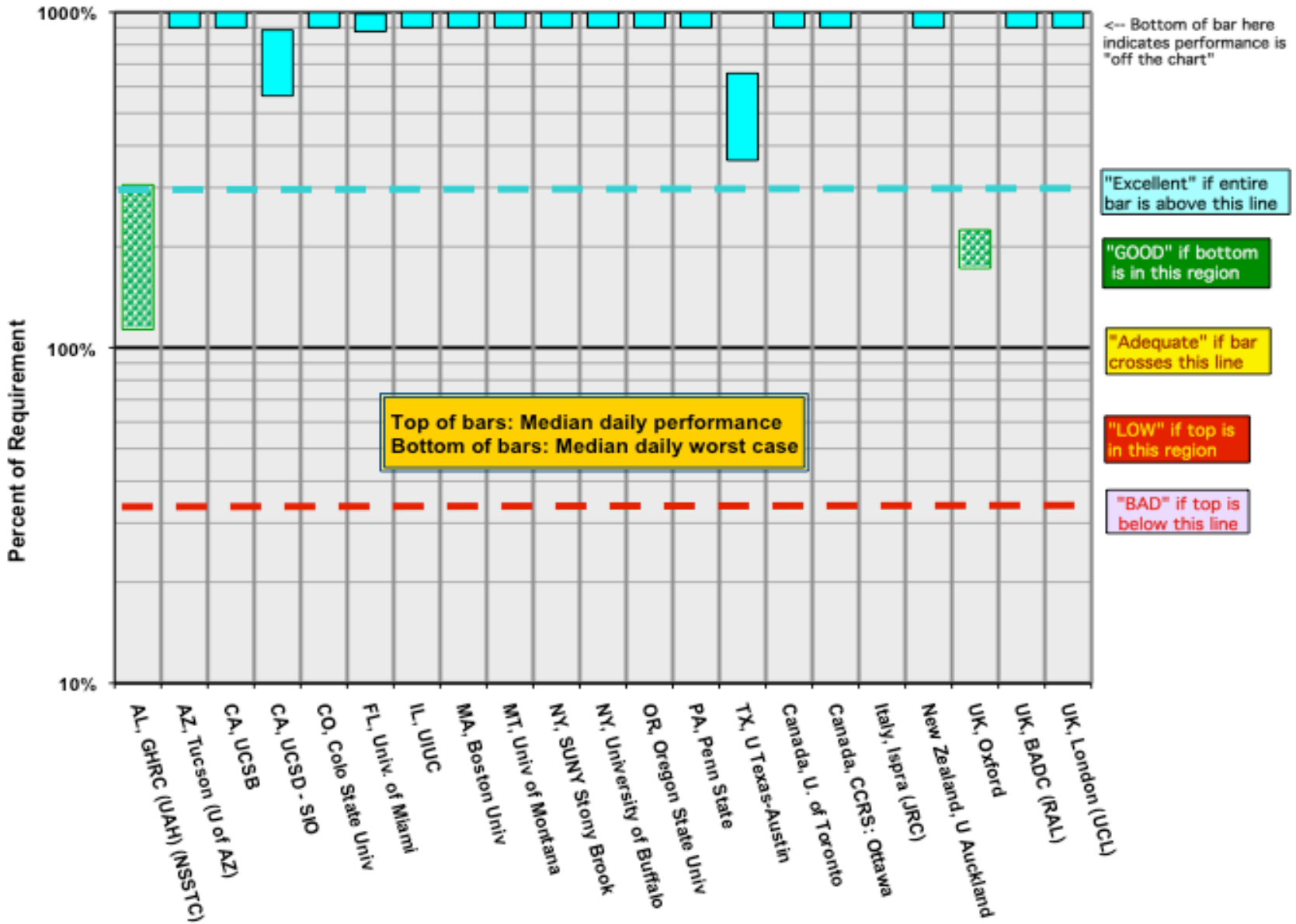
4th Quarter 2011			Testing							
Destination	Team (s)	Requirement Nov-07	Source Node	Median Daily Best	Median mbps	Median Daily Worst	Average User Flow	Rating re Current Requirements 4 Q 2011	Rating re Current Requirements 3Q11	Route Tested
AL, GHRC (UAH) (NSSTC)	CERES, ASTER, LIS	6.9	LaRC PTH	40.9	21.2	7.9		Good	Ad	NISN / MAX / Internet2 / SOX / UAH
AZ, Tucson (U of AZ)	MODIS	2.6	EROS LPDAAC	71.3	69.5	60.7	0.34	Excellent	Ex	StarLight (Chicago) / Internet2 / CENIC
CA, UCSB	MODIS	3.1	GSFC-MODIS	95.6	74.8	45.8	2.00	Excellent	Ex	MAX / Internet2 / CENIC
CA, UCSD - SIO	ICESAT, CERES	7.1	GSFC-ICESAT	75.5	62.9	40.0		Excellent	Ex	NISN / MAX / Internet2 / CENIC
CO, Colo State Univ	CERES	2.1	LaRC ANGe	109.0	108.9	108.5		Excellent	Ex	NISN / MAX / Internet2 / FRGP
FL, Univ. of Miami	MODIS, MISR	18.8	GSFC-NISN-PTH	255.2	186.2	164.9	0.07	Excellent	Ex	MAX / Internet2 / SOX
IL, UIUC	MISR	1.1	LaRC PTH	114.3	86.2	29.0		Excellent	Ex	Internet2 via NISN / MAX
MA, Boston Univ	MODIS, MISR	3.0	EROS LPDAAC	249.2	232.8	159.2	1.8	Excellent	Ex	StarLight (Chicago) / Internet2 / NOX
MT, Univ of Montana	MODIS	0.8	EROS LPDAAC	85.2	85.0	81.6	18.6	Excellent	Ex	StarLight (Chicago) / Internet2 / PNW
NY, SUNY Stony Brook	CERES	0.6	LaRC ANGe	67.4	53.7	29.7		Excellent	Ex	NISN / MAX / Internet2 / NYSERnet
NY, University of Buffalo	ICESAT	6.3	GSFC-ICESAT	90.2	89.0	83.7		Excellent	Ex	NISN / MAX / Internet2 / NYSERnet
OR, Oregon State Univ	CERES, MODIS	7.6	LaTIS	115.9	115.7	115.4		Excellent	Ex	NISN / MAX / Internet2 / PNW
PA, Penn State	MISR	2.6	LaRC PTH	59.7	59.0	55.0		Excellent	Ex	NISN / MAX / 3ROX
TX, U Texas-Austin	ICESAT	11.1	GSFC-ICESAT	107.8	72.7	40.0	0.4	Excellent	Good	NISN / MAX / Internet2 / TX-learn
Canada, U. of Toronto	MOPITT	0.6	LaRC DAAC	66.3	65.5	60.8		Excellent	Ex	NISN / StarLight (Chicago) / CA*net4
Canada, CCRS: Ottawa	CEOS, MODIS	3.8	GSFC-MODIS	108.6	102.8	86.7	3.2	Excellent	Ex	MAX / Internet2 / CA*net4
Italy, Ispra (JRC)	MISR	0.5	LaRC DAAC	n/a	n/a	n/a		n/a	Ex	NISN / MAX / Géant (DC) / GARR
New Zealand, U Auckland	MISR	0.3	LaRC PTH	75.4	72.3	22.0		Excellent	Ex	NISN / StarLight (Chicago) / PNW / PacWave
UK, Oxford	HIRDLS	0.5	GSFC-ENPL-PTH	1.30	1.15	0.88	0.18	Good	Good	Internet2 / Géant (DC) / JAnet
UK, BADC (RAL)	HIRDLS	0.2	GSFC-ESDIS-PTH	28.8	19.6	9.7	0.08	Excellent	Ex	Internet2 / Géant (DC) / JAnet
UK, London (UCL)	MISR, MODIS	1.0	LaRC PTH	34.4	30.4	18.5		Excellent	Ex	NISN / MAX / Géant (DC) / JAnet

		Revised
	*Rating Criteria:	
Excellent	Median Daily Worst >= 3 * **Requirement**	
Good	Median Daily Worst >= **Requirement**	
Adequate	Median Daily Worst < **Requirement** <= Median Daily Median	
LOW	Median Daily Median < **Requirement**	
BAD	Median Daily Median < **Requirement** / 3	

Summary		
Rating	Current: 4 Q 2011	Prev Report
Excellent	18	18
Good	2	2
Adequate	0	1
LOW	0	0
BAD	0	0
Total	20	21
GPA	3.90	3.81

EOS QA SCF Sites

Daily Median and Worst Performance as a percent of Requirements



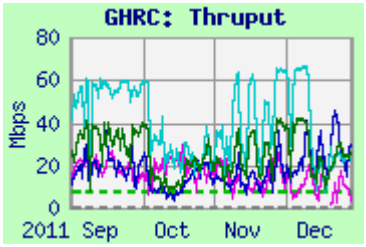
Details on individual sites:

Each site listed below is the DESTINATION for all the results reported in that section. Other tests are also listed. The three values listed are derived from [nominally] 24 tests per day. For each day, a daily best, worst, and median is obtained. The values shown below are the medians of those values over the test period.

1) AL, GHRC (UAH) (aka NSSTC)

Rating: ↑ Adequate → Good

Teams: CERES, AMSR
Domain: nsstc.uah.edu
Web Page:http://ensight.eos.nasa.gov/Missions/terra/NSSTC.shtml



Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC-PTH	40.9	21.2	7.9	NISN / MAX / I2 / SOX
GSFC-CNE	60.8	28.3	9.5	
GSFC-EDOS	29.5	14.5	2.1	NISN
GSFC-EDOS	46.4	15.2	4.0	MAX / I2 / SOX

Requirements:

Source Node	FY	Mbps	Rating
LaRC ANGe	'06 –	7.0	Good

Comments: Although the daily best was similar to the previous period, the daily median, and especially the daily worst improved from LaRC. The median daily worst thruput from LaRC-PTH is again above the requirement, so the rating improves to **Good**.

Testing was initiated in December '10 from GSFC-EDOS via both NISN and Internet2 for LANCE flows.

Note: Testing between GHRC, RSS and NSIDC for AMSR-E (AQUA) is now in the "Production Sites" report.

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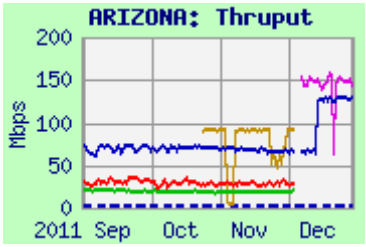
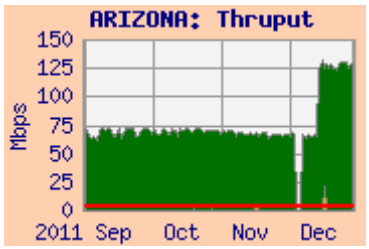
2) AZ, Tucson (U of AZ):

Rating: Continued **Excellent**

Team: MODIS
Domain: arizona.edu
Web Page: http://ensight.eos.nasa.gov/Missions/terra/ARIZONA.shtml





Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EROS LPDAAC	71.3	69.5	60.7	StarLight / CENIC
EROS SCP	22.2	19.0	14.8	
EROS PTH SCP	40.5	28.3	6.2	
GSFC ENPL-FE	93.0	91.0	87.0	MAX / I2 / CENIC
GSFC ENPL-GE	163.3	147.9	127.0	

Requirements:

Source Node	FY	Mbps	Rating
EROS LPDAAC	'03 -	2.6	Excellent

Comments: The Arizona test node was upgraded in December, with improved thruput from GSFC-ENPL and EROS. SCP testing was discontinued at that time. Thruput from EROS LPDAAC had been stable since it improved in January '11. The median daily worst was way above 3 x the requirement, so the rating remains "**Excellent**".

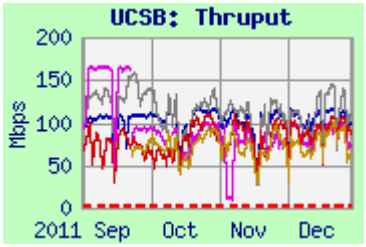
From GSFC-ENPL, thruput is even better and very stable.

The average user flow from EROS was only about 0.34 mbps, similar to the previous period, but way below the requirement.

3) CA, UCSB :

Ratings: GSFC: Continued **Excellent**
EROS: Continued **Excellent**

Teams: MODIS
Domain: ucsb.edu
Web page: http://ensight.eos.nasa.gov/Missions/terra/UCSB.shtml



Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MODIS	95.6	74.8	45.8	MAX / I2 / CENIC
GSFC-GES DISC	111.5	87.5	49.6	
GSFC-ENPL	103.8	80.9	52.0	
EROS-LPDAAC	115.8	107.4	78.0	StarLight / I2 / CENIC
EROS-PTH	141.2	111.7	60.9	

Requirements:

Source Node	FY	mbps	Rating
GSFC	'04 -	3.1	**Excellent**
EROS-LPDAAC	'04 -	2.2	**Excellent**

Comments: The requirements are split between EROS and GSFC. Thruput from all sites is pretty stable. The rating remains "**Excellent**" from both EROS and GSFC-MODIS. The user flow from GSFC averaged only 2.0 mbps this period, close to typical and the requirement.

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4) CA, UCSD (SIO):

Ratings: ICESAT: Continued **Excellent**
ANGe: Continued **Excellent**

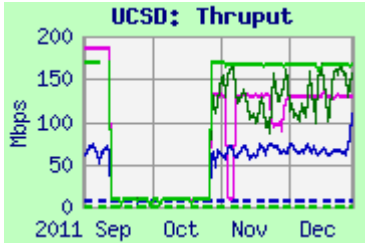
Teams: CERES, ICESAT
Domain: ucsd.edu
Web Page: http://ensight.eos.nasa.gov/Missions/terra/UCSD.shtml

Test Results:

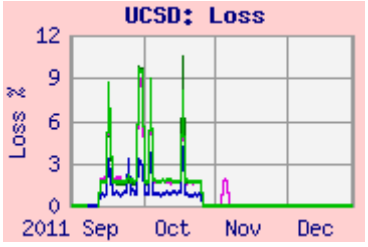
Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	75.5	62.9	40.0	NISN SIP / MAX / I2 / CENIC
LaRC ANGe (LaTIS)	168.5	166.7	154.4	
GSFC-ESDIS-PS	163.5	122.8	77.6	MAX / I2 / CENIC
GSFC-ENPL	134.2	129.5	124.7	

Requirements:

Source Node	FY	mbps	Rating
GSFC-ICESAT	'05 –	7.0	**Excellent**
LaRC ANGe	'02 -	0.26	**Excellent**



Comments: Performance from all sources was quite stable, until a dramatic drop in early September, with high packet loss (fixed in late October). The median daily minimum thruput from ICESAT was still above 3 x the requirement, so the rating remains "**Excellent**"



Performance from both GSFC-ENPL and GSFC-ESDIS-PS is better and was steadier until the dropoff. There was no measurable user flow from ICESAT during this period.

Performance from ANGe (LaTIS) was also very stable until the dropoff. The ANGe rating continues as "**Excellent**".

5) CO, Colo State Univ.:

Rating: Continued **Excellent**

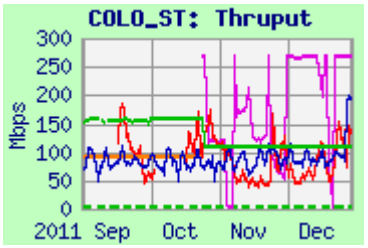
Teams: CERES, ICESAT
Domain: colostate.edu
Web page: http://ensight.eos.nasa.gov/Missions/terra/COLO_ST.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ANGe (LaTIS)	109.0	108.9	108.5	NISN SIP / MAX / I2 / FRGP
GSFC-ICESAT	121.6	83.6	41.5	
GSFC-ESDIS-PS	172.1	75.6	30.7	MAX / I2 / FRGP
GSFC-ENPL	269.0	174.2	107.1	

Requirements:

Source Node	FY	mbps	Rating
LaRC ANGe (LaTIS)	'04 -	2.15	**Excellent**



Comments: Thruput from LaRC ANGe dropped in late October, but was otherwise very stable, with a very small best:worst ratio. It remained well above 3 x the requirement, so the rating remains "**Excellent**".

Testing from GSFC-ENPL, outside most GSFC campus firewalls, is better but somewhat noisier. Testing from GSFC-ESDIS-PS (on EBnet) has some packet loss, resulting in lower thruput and nosiier performance.

Testing from ICESAT, on GSFC's CNE, was retuned in late December, with improved results

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6) FL, Univ. of Miami:

Rating: GSFC: Continued **Excellent**
LaRC: Continued **Excellent**

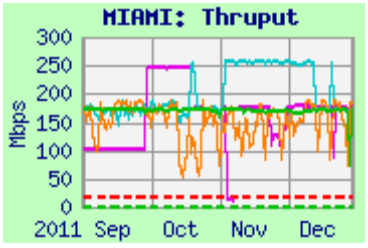
Teams: MODIS, MISR
Domain: rsmas.miami.edu
Web page: http://ensight.eos.nasa.gov/Missions/terra/MIAMI.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-NISN	255.2	186.2	164.9	MAX / I2 / SOX
GSFC-ENPL	177.0	175.3	164.0	
LaRC ASDC	173.5	170.9	140.5	NISN / MAX / I2 / SOX
LaRC PTH	188.5	155.1	40.9	

Requirements:

Source Node	FY	mbps	Rating
GSFC	'04 -	18.8	**Excellent**
LaRC ASDC	'04 -	1.1	**Excellent**



Comments: Thruput from GSFC-NISN was bimodal (either around 175 or 250 mbps), and the average daily worst was well above 3x the requirement, so the rating remains "**Excellent**". A similar pattern was seen from GSFC-ENPL.

Thruput was very steady from LaRC ASDC, but noisier from LaRC PTH. The rating from LaRC remains "**Excellent**".

7) IL, UIUC:

Rating: LaRC: **Excellent**

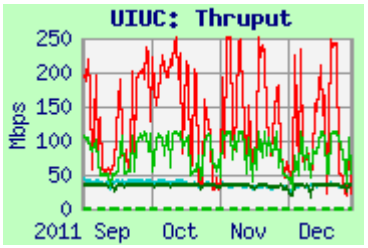
Teams: MISR

Domain: uiuc.edu

Web page: http://ensight.eos.nasa.gov/Missions/terra/UIUC.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC PTH-SCP	114.3	86.2	29.0	NISN / StarLight / I2
LaRC PTH	37.4	34.4	22.1	
GSFC-NISN-SCP	258.1	127.6	29.4	MAX / I2
GSFC-NISN	40.7	34.4	26.0	



Requirements:

Source Node	FY	mbps	Rating
LaRC ASDC	'04 -	1.1	**Excellent**

Comments: Testing was added to UIUC in August '10. Initially, SCP testing was initiated from GSFC and LaRC, sending files to UIUC. SCP thruput is noisy from both sources, somewhat bimodal, but well above the requirement; so the rating remains **Excellent**.

In October '10, nuttcp testing was added, initiated by UIUC, receiving from GSFC and LaRC. Thruput on these tests is steadier than SCP, but much lower, apparently due to significant incoming packet loss (which is causing the noisiness on the SCPs as well).

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8) MA, Boston Univ:

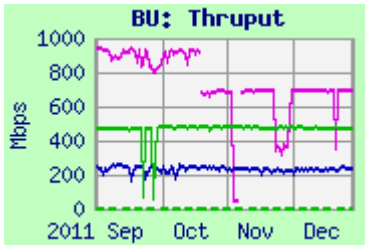
Ratings: EROS: Continued **Excellent**
LaRC: Continued **Excellent**

Teams: MODIS, MISR Domain: bu.edu

Web Page: http://ensight.eos.nasa.gov/Missions/terra/BU.shtml

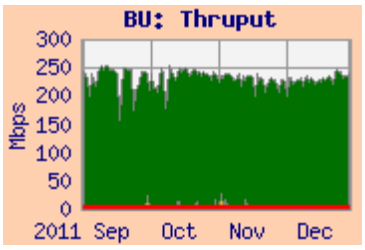
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EROS LPDAAC	249.2	232.8	159.2	StarLight / I2 / NOX
GSFC ENPL	695.4	690.5	628.6	MAX / I2 / NOX
LaRC ASDC	480.1	476.6	428.5	NISN / MAX / I2 / NOX



Requirements:

Source Node	FY	mbps	Rating
EROS LPDAAC	'04 -	3.0	**Excellent**
LaRC ASDC DAAC	'04 -	1.2	**Excellent**

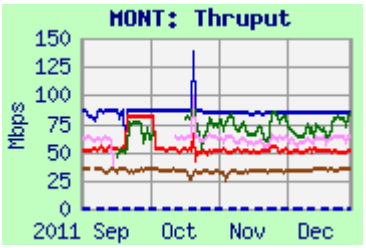


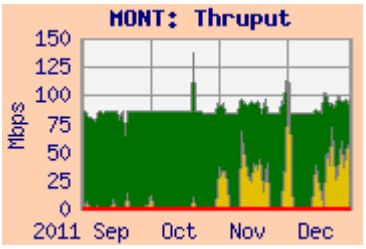
Comments: BU is well connected. Thruput from all sources was much better than the requirements, rating "**Excellent**". From EROS LPDAAC, the user flow (shown on the integrated graph) averaged about 1.8 mbps for this period – close to the requirement without contingency. Thruput from GSFC and LaRC ASDC DAAC also greatly exceeded the requirements. User flow from GSFC averaged a typical 1.2 mbps.

9) MT, Univ of Montana:

Rating: Continued **Excellent**

Teams: MODIS
Domain: ntsg.umt.edu
Web Page: http://ensight.eos.nasa.gov/Missions/terra/MONT.shtml





Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EROS LPDAAC	85.2	85.0	81.6	StarLight / I2 / PNW
EROS PTH	57.6	50.9	44.7	
GSFC-ESDIS	65.1	61.6	49.1	MAX / I2 / PNW
NSIDC	34.6	33.1	30.4	CU / FRGP / I2 / PNW

Requirement:

Source Node	FY	mbps	Rating
EROS LPDAAC	'04 -	0.82	**Excellent**

Comments: Performance from all sources was quite stable. With the very low requirement, the rating remains "**Excellent**". The average user flow from EROS was 18.6 mbps for the 3 month period – way above the typical value and the requirement.

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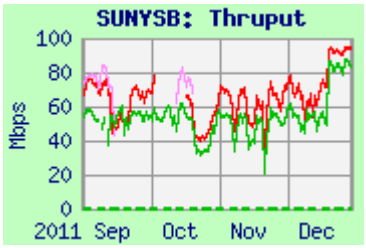
10) NY, SUNY-SB:

Rating: Continued **Excellent**

Teams: CERES, MODIS
Domain: sunysb.edu
Web Page: http://ensight.eos.nasa.gov/Missions/terra/SUNYSB.shtml



Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ANGe	67.4	53.7	29.7	NISN / MAX / I2 / NYSERnet
GSFC-ESDIS	82.5	66.2	41.0	MAX / I2 / NYSERnet

Requirements:

Source Node	FY	mbps	Rating
LaRC ANGe	'02 -	0.57	**Excellent**

Comments: Thruput improved from both sources in December with retuning. The daily worst for this period from LaRC ANGe was well above 3 x the requirement, so the rating remains "**Excellent**".

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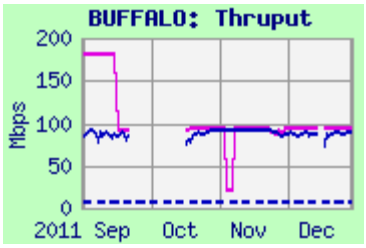
11) NY, University of Buffalo:

Rating: Continued **Excellent**

Team: ICESAT
Domain: buffalo.edu
Web Page: http://ensight.eos.nasa.gov/Missions/icesat/BUFFALO.shtml



Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	90.2	89.0	83.7	NISN / MAX / I2 / NYSERnet
GSFC-ENPL	94.1	93.9	92.9	MAX / I2 / NYSERnet

Requirements:

Source Node	FY	mbps	Rating
GSFC-ICESAT	'09 -	6.3	**Excellent**

Comments: This node replaced Ohio-State for ICESAT, and assumes its requirement. The thruput was very stable until the test node went down in mid-September (restored in mid October), and was well above 3 x the requirement from both sources, so the rating remains "**Excellent**".

12) OR, Oregon State Univ:

Ratings: LaRC ANGe: Continued **Excellent**
GSFC: Continued **Excellent**

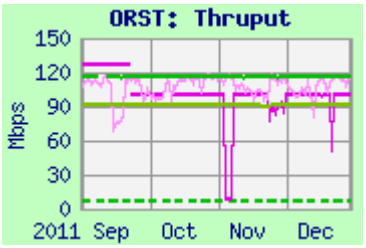
Teams: CERES, MODIS Domain: oce.orst.edu
Web Page:http://ensight.eos.nasa.gov/Missions/terra/ORST.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ANGe (LaTIS)	115.9	115.7	115.4	NISN / MAX / I2 / PNW
JPL-PTH	91.2	91.0	91.0	CENIC / I2 / PNW
GSFC-ESDIS-PTH	119.2	109.0	84.9	MAX / I2 / PNW
GSFC-ENPL	101.9	100.4	96.8	

Requirements:

Source Node	FY	mbps	Rating
LaRC ANGe	'04 -	7.5	**Excellent**
GES DISC	'02 -	0.25	**Excellent**



Comments: Thruput was very stable from all sources for this period, and was well above the requirements. The ratings from both LaTIS and GSFC remain " **Excellent** "

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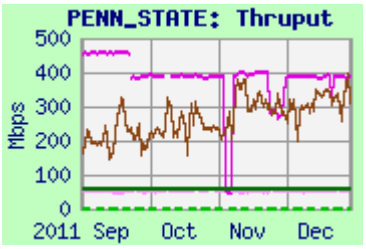
13) PA: Penn State Univ:

Rating: Continued **Excellent**

Team: MISR Domain: psu.edu
Web Page: http://ensight.eos.nasa.gov/Missions/terra/PENN_STATE.shtml

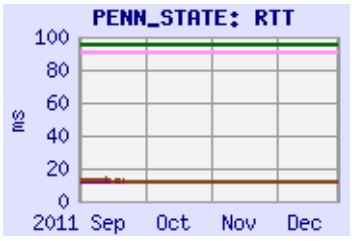
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC-PTH	59.7	59.0	55.0	NISN / MAX / I2 / 3ROX
GSFC-ESDIS-PTH	57.2	54.1	45.0	MAX / I2 / 3ROX
GSFC-ENPL	391.9	388.8	365.4	
GSFC-ESTO	354.1	289.9	182.5	



Requirements:

Source Node	FY	mbps	Rating
LaRC DAAC	'03 -	2.6	**Excellent**



Comments: Thruput from NISN sources is much lower than from non-NISN sources, due to much longer RTT. Note that the forward route (to PSU) is OK (see above), but the return route to LaRC and GSFC-ESDIS-PTH is much longer -- now via peering with NISN in Chicago! But due to the low requirement, the rating remains " **Excellent** ".

From GSFC-ESTO (on the SEN at GSFC, not EBnet) and from GSFC-ENPL (direct GigE to MAX), the RTT is lower (due to the optimum return route), and the thruput is higher than from other sources.

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14) University of Wisconsin

Reporting for this site has been transferred to the EOS Production sites monthly report, due to NPP production requirements as Atmospheric PEATE and NPP Launch in October 2011.

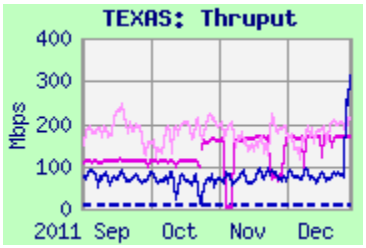
15) TX: Univ. of Texas - Austin:

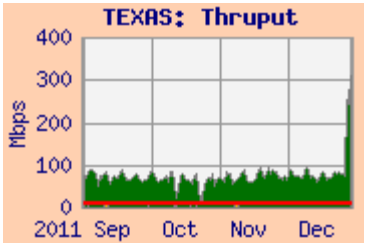
Rating: ↑ Good → Excellent

Team: ICESAT
Domain: utexas.edu
Web Page: http://ensight.eos.nasa.gov/Missions/icesat/TEXAS.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ICESAT	107.8	72.7	40.0	NISN / MAX / I2 / TX
GSFC-ENPL-PTH	169.7	164.3	133.5	MAX / I2 / TX
GSFC-ESDIS-PTH	222.9	177.1	101.4	





Requirements:

Source Node	FY	mbps	Rating
GSFC-ICESAT	'05 -	11.1	Excellent

Comments: Thruput from ICESAT was mostly steady until late December, when it improved greatly due to retuning. Even before that, the daily minimum thruput remained above 3 x the requirement, so the rating improved to "**Excellent**".

Thruput from GSFC-ESDIS-PTH improved in late May, when TSO was disabled, reducing packet loss.

From GSFC-ENPL, outside most of the congested GSFC campus infrastructure, thruput is less noisy.

The average user flow this period was only 380 kbps, only about 3.5% of the requirement, a bit lower than last quarter.

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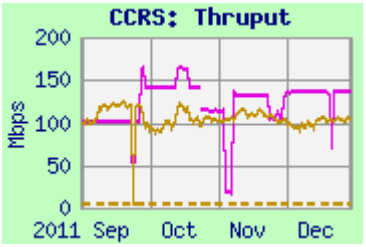
16) Canada: CCRS (Ottawa)

Rating: Continued Excellent

Teams: MODIS, CEOS
Domain: ccrs.nrcan.gc.ca
Web Page: http://ensight.eos.nasa.gov/Missions/terra/CCRS.shtml

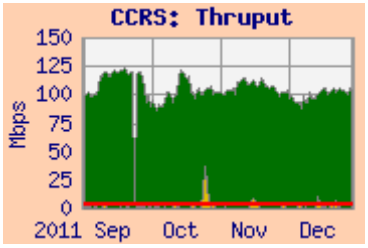
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MODAPS	108.6	102.8	86.7	MAX / I2 / CA*net
GSFC-ENPL	134.0	132.4	130.8	



Requirement:

Source Node	FY	mbps	Rating
GSFC-MODAPS	'11 -	3.8	Excellent



The MODIS requirement (3.8 mbps) is now incorporated for this site.

Thruput was pretty steady and much more than 3 x the requirement, so is rated "**Excellent**".

User flow from GSFC averaged 3.2 mbps this period, consistent with the requirement.

17) Canada, Univ of Toronto:

Rating: GSFC: Continued **Excellent**
LaRC: Continued **Excellent**

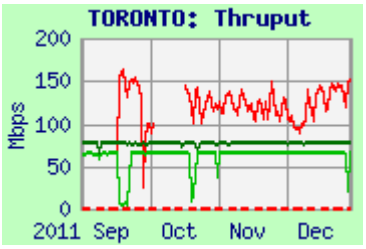
Team: MOPITT Domain: utoronto.ca
Web Page: http://ensight.eos.nasa.gov/Missions/terra/TORONTO.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ASDC DAAC	66.3	65.5	60.8	NISN / StarLight / CA*net
LaRC PTH	77.5	77.1	71.8	
GSFC-ESDIS-PS	158.4	120.2	42.4	MAX / I2 / NY / CA*net

Requirements:

Source Node	FY	kbps	Rating
LaRC DAAC	'02 -	100	**Excellent**
GSFC EOC	'02 -	512	**Excellent**



Comments:

Thruput from both LaRC ASDC DAAC and LaRC PTH was very stable. The ratings from both sources remain "**Excellent**", due to the low requirements.

Testing was switched from GSFC-ESDIS-PTH to GSFC-ESDIS-PS in mid September, with improved results. User flow from GSFC averaged only 15 kbps this period.

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18) Italy, EC - JRC:

Rating: n/a
Team: MISR Domain: jrc.it
Web Page: http://ensight.eos.nasa.gov/Missions/terra/JRC.shtml

Testing was terminated in September 2011 on request from JRC. However, EOS has requested that testing be resumed.

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19) University of Auckland, New Zealand

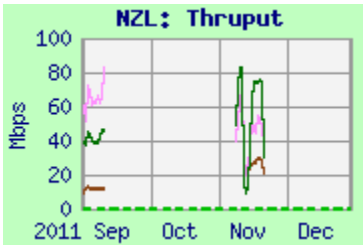
Rating: Continued **Excellent**
Teams: MISR Domain: auckland.ac.nz
Web Page: http://ensight.eos.nasa.gov/Missions/terra/NZL.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC-PTH	75.4	72.3	22.0	NISN / Chicago / I2 / PNW / PacWave
GSFC-ESDIS-PTH	67.0	47.1	26.8	MAX / I2 / PNW / PacWave
GSFC-ESTO	30.1	27.0	20.0	

Requirement:

Source Node	FY	mbps	Rating
LaRC	'11 -	0.3	**Excellent**



The old test node went down in mid September, and was replaced in November. However, neither node has responded since mid November.

Thruput from LaRC-PTH was noisy but well above the low requirement; the rating remains "**Excellent**".

Thruput was similar from GSFC-ESDIS-PTH.

20) UK, London: (University College)

Rating: Continued **Excellent**

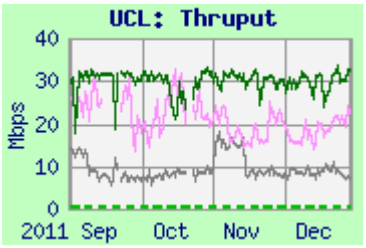
Teams: MODIS, MISR
Domain: ucl.ac.uk
Web Page: http://ensight.eos.nasa.gov/Missions/terra/UCLSCF.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC PTH	34.4	30.4	18.5	NISN / MAX / Géant / JAnet
GSFC-ESDIS-PTH	28.8	19.6	9.7	MAX / I2 / Géant (DC) / JAnet
EROS-PTH	16.3	8.4	3.7	StarLight / I2 / Géant (DC) / JAnet

Requirements

Source Node	FY	mbps	Rating
LaRC DAAC	'02 –	1.03	**Excellent**



Comments: Testing since November and December '10 is by nuttcp pulls, initiated at UCL.

NISN began peering with Géant in September '09, with improved thruput from LaRC. Previously, the route from LaRC was via NISN peering with Teleglobe on the US west coast, unnecessarily increasing RTT and reducing thruput.

The median daily worst thruput from LaRC remained well above 3 x the requirement, so the rating remains "**Excellent**"

From GSFC-ESDIS, thruput was a bit lower and noisier.

Thruput from EROS is lower than the other sites, due to a longer RTT.

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21) UK, Oxford Univ.:

Rating: Continued **Good**

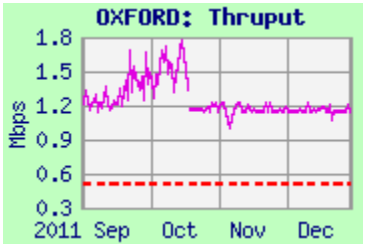
Team: HIRDLS
Domain: ox.ac.uk
Web Page: http://ensight.eos.nasa.gov/Missions/aura/OXFORD.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ENPL	1.30	1.15	0.88	MAX / I2 / Géant (DC) / JAnet

Requirements: (IST Only)

Source Node	FY	kbps	Rating
GSFC	'03 –	512	**Good**



Comments: Testing resumed in April '10, but using "flood pings", which is a poor substitute for iperf, and provides much lower results, now rated "**Good**". The drop in mid October is due to test host change at GSFC. User flow from GSFC to Oxford averaged only 170 kbps for this period (vs. 175 last period).

Note: Testing to Oxford had been down since the old Oxford test host was retired (in April '08). At that time iperf performance had been mostly stable at about 25 mbps since October '06 (similar to BADC, below, which is similarly connected to JAnet), rating "**Excellent**".

22) British Atmospheric Data Centre

Rating: Continued **Excellent**

(Rutherford Appleton Laboratory) Team: HIRDLS Domain: rl.ac.uk

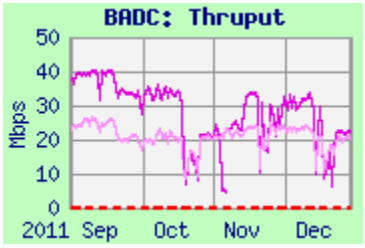
Web Page: http://ensight.eos.nasa.gov/Missions/aura/UK_RAL.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ENPL	31.9	22.3	14.7	MAX / I2 / Géant (DC) / JAnet
GSFC-ESDIS-PTH	23.9	20.8	16.3	

Requirements:

Source Node	FY	mbps	Rating
GSFC	'02 –	0.19	**Excellent**



Comments: Thruput from GSFC-ENPL was similar to that from GSFC-ESDIS-PTH. The thruput has consistently been much higher than the requirement, so the rating remains "**Excellent**".